AUTONOMOUS TRAVEL SYSTEM

TECHNICAL FIELD

[0001] The present invention mainly relates to an autonomous travel system for causing a work vehicle, on which a work machine is mounted, to travel along a path.

BACKGROUND ART

[0002] There is a case in which a farm field is divided into a work area, in which a work vehicle is caused to mainly travel straight to perform work, and a headland area, which is positioned around the work vehicle for turning the work vehicle, for example. In Patent Literature 1, there is described that a path on which a work vehicle is caused to autonomously travel is created in both of these kinds of work area and headland area.

CITATION LIST

Patent Literature

[0003] Patent Literature 1: Japanese Unexamined Patent Application Publication No. H11-266608

DISCLOSURE OF INVENTION

Problems to be Solved by the Invention

[0004] However, in Patent Literature 1, a specific creation method or a specific usage method of a path for a headland area is not described in detail. Since headland areas have different characteristics from work areas, the path creation method or usage method of a work area cannot be simply applied.

[0005] The present invention has been made in view of the above situation, and the main object thereof is to provide an autonomous travel system in which an auxiliary line that can be utilized as a path in a headland area is created, so that it is possible to cause a work vehicle to properly perform autonomous traveling in the headland area.

Means For Solving the Problems and Effect of the Invention

[0006] The problem to be solved by the present invention is as described above, and the means for solving this problem and the effect thereof will be explained in the following.

[0007] According to the first aspect of the present invention, an autonomous travel system having the following configuration is provided. That is, this autonomous travel system includes a farm field acquisition unit, a reference auxiliary line creation unit, an adjacent auxiliary line creation unit, and a travel control unit. The farm field acquisition unit obtains information of a farm field including a work area, in which a travel path for a work vehicle on which a work machine is mounted to autonomously travel to perform work is set, and a headland area, which is formed between the work area and a farm field peripheral edge. The reference auxiliary line creation unit creates a first reference auxiliary line in the headland area at a position that is distant inward from the farm field peripheral edge by a first reference interval, which is ½ of a work width or ½ of a work machine width. The adjacent auxiliary line creation unit creates a first adjacent auxiliary line at a position that is distant inward from the first reference auxiliary line by an auxiliary line interval, which is a value obtained by subtracting an overlap amount from the work width or a value obtained by adding a work interval to the work width. The total number of the first reference auxiliary line and first adjacent auxiliary lines to be created inside of a predetermined side of the farm field peripheral edge is a value obtained by rounding up decimal places of L/S if a headland width, which is a distance from the farm field peripheral edge to the work area, is L and the auxiliary line interval is S. The travel control unit causes the work vehicle to autonomously travel along at least a part of the first reference auxiliary line and first adjacent auxiliary lines.

[0008] Accordingly, by creating auxiliary lines with reference to the farm field peripheral edge and making the work vehicle autonomously travel along the auxiliary lines, it is possible to prevent remaining work from occurring in the headland area.

[0009] According to the second aspect of the present invention, an autonomous travel system having the following configuration is provided. That is, this autonomous travel system includes a farm field acquisition unit, a reference auxiliary line creation unit, an adjacent auxiliary line creation unit, and a travel control unit. The farm field acquisition unit obtains information of a farm field including a work area, in which a travel path for a work vehicle on which a work machine is mounted to autonomously travel to perform work is set, and a headland area, which is formed between the work area and a farm field peripheral edge. The reference auxiliary line creation unit creates a second reference auxiliary line in the headland area at a position that is distant outward from a work area peripheral edge by a second reference interval, which is a value obtained by subtracting an overlap amount from ½ of a work width or a value obtained by adding a work interval to ½ of the work width. The adjacent auxiliary line creation unit creates a second adjacent auxiliary line at a position that is distant outward from the second reference auxiliary line by an auxiliary line interval, which is a value obtained by subtracting the overlap amount from the work width or a value obtained by adding the work interval to the work width. The total number of the second reference auxiliary line and second adjacent auxiliary lines to be created outside of a predetermined side of the work area peripheral edge is a value obtained by rounding down decimal places of L/S or a value obtained by subtracting **1** from the value obtained by rounding down decimal places of L/S if a headland width, which is a distance from the farm field peripheral edge to the work area, is L and the auxiliary line interval is S. The travel control unit causes the work vehicle to autonomously travel along at least a part of the second reference auxiliary line and second adjacent auxiliary lines.

[0010] Accordingly, by creating auxiliary lines with reference to the work area peripheral edge and making the work vehicle to autonomously travel along the auxiliary lines, it is possible to keep a constant work pitch in the headland area.

[0011] In the autonomous travel system, the following configuration is preferable. That is, the reference auxiliary line creation unit is capable of creating the first reference auxiliary line and is capable of creating a second reference auxiliary line. The adjacent auxiliary line creation unit is capable of creating the first adjacent auxiliary line and is capable of creating a second adjacent auxiliary line. Furthermore, the autonomous travel system further includes an